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CLAIMS

1. A solid oxide fuel cell comprising a solid oxide electrolyte layer, a cathode layer on a cathode side of the electrolyte layer and an anode layer on an anode side of the electrolyte layer, and wherein a hydrocarbon reforming layer is also disposed on the anode side of the electrolyte layer, said hydrocarbon reforming layer having a composition different from that of the anode layer and comprising a catalyst for promoting a hydrocarbon steam reforming reaction and a component, or a precursor of such a component, for alleviating carbon deposition on the hydrocarbon reforming layer.
2. A fuel cell according to claim 1, wherein the hydrocarbon reforming layer overlies the anode layer so as to at least partially cover the anode layer.
3. A fuel cell according to claim 1, wherein the hydrocarbon reforming layer is provided as a separate layer on the anode side of the electrolyte, in one or more parts.
4. A fuel cell according to claim 1 or 2, wherein the hydrocarbon reforming layer entirely covers the anode layer.
5. A fuel cell according to claim 1, wherein the hydrocarbon reforming layer is provided upstream of the anode layer, relative to the fuel stream flow to the fuel cell, so as to ensure that substantially all of the hydrocarbons in the fuel stream are steam reformed before the fuel stream contacts the anode layer.
6. A fuel cell according to any one of the preceding claims, wherein the component for alleviating carbon deposition is selected from cerium oxide, praseodymium oxide, lanthanum oxide, samarium oxide, tungsten oxide, molybdenum oxide, alkaline earth based materials oxide, and alkali based materials, and precursors thereof.
7. A fuel cell according to any one of the preceding claims, wherein the proportion of the component for alleviating carbon deposition in the hydrocarbon reforming layer is in the range 1-60 wt.%.

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8. A fuel cell according to any one of the preceding claims, wherein the hydrocarbon reforming layer contains nickel in an amount of at least 30 vol.% (approximately 40 wt.%).
9. A fuel cell according to any one of the preceding claims, wherein the composition of the hydrocarbon reforming layer is a nickel-zirconia cermet including the component, or precursor of such a component, for alleviating carbon deposition.
10. A fuel cell according to any one of the preceding claims, wherein the mean thickness of the hydrocarbon reforming layer is from 20 to 100 μm for an electrolyte or cathode layer-supported fuel cell, and from 300 to 500 μm for an anode layer-supported fuel cell.
11. A fuel cell according to any one of the preceding claims, wherein the hydrocarbon reforming layer has a porosity of from 20 to 70 %.
12. A fuel cell according to any one of the preceding claims, wherein the anode layer has a porosity of from 7 to 50%.
13. A fuel cell according to claim 1, wherein the hydrocarbon reforming layer overlies the anode layer and a porous conductive layer is provided over the hydrocarbon reforming layer.
14. A fuel cell according to claim 1, wherein the hydrocarbon reforming layer is separate to the anode layer and a porous conductive layer is provided over the anode layer.
15. A method of manufacturing a solid oxide fuel cell, which method comprises providing a solid oxide fuel cell precursor comprising a solid oxide electrolyte layer, a cathode layer on a cathode side of the electrolyte layer and an anode on the anode side of the electrolyte layer, and disposing a hydrocarbon reforming layer on the anode side of the electrolyte layer, said hydrocarbon reforming layer having a composition different from that of the anode layer and comprising a catalyst for promoting a hydrocarbon steam reforming reaction and a component, or a precursor of such a component, for alleviating carbon deposition on the hydrocarbon reforming layer.